COMPLIMENTS OF THE AUTHOR.

Supra-Pubic Cystotomy for Calculus of the Bladder.

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Read before the St. Louis Medical Society, Dec. 22, 1894.

BY A. H. MEISENBACH, M.D.
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The object of this short paper is to bring to your notice an operation, which though described in several works on surgery in the German[1] is not mentioned (so far as I have been able to investigate) in any English or American text-book on surgery, with the exception of the English translation of Kocher's "Operative Surgery" recently published. I do not believe that the technique of this operation as practiced by Trendelenburg, Tillman, Kocher and other Continental surgeons is generally known or practiced in this country. The operation I have reference to is the operation of supra-pubic cystotomy, by a transverse incision through the skin and abdominal muscles, without previous inflation of the rectum or injection of the bladder. This operation is known as Trendelenburg's method of supra-pubic cystotomy (*sectio alta*) by means of the transverse incision.

This method was first suggested by Günther and carried out afterward by Bruns-Lotzbeck. To Trendelenburg, is due the credit of bringing the operation to general notice in Germany, and perfecting the technique, such as is now practiced by himself, Tillman, Kocher and others. The technique of this operation renders it unnecessary that the rectum and bladder be previously distended, which in the *sectio alta* by means of the median vertical incision is of

[1] Koenig, Kocher, Tillman.

importance, especially the injection with fluids or air of the bladder. The majority of surgeons have now discarded the inflation of the rectum, but still use some method of distending the bladder, either by fluids or air.

As you are all aware, the object in inflating the rectum or distending the bladder, is to bring the viscus out from behind the pubes, thus rendering it more accessible especially in the adult; also to increase the dimensions of the pre-vesical space by pushing up the peritoneum. It is well known through experience, that inflation of the rectum is at the best unsatisfactory, and has therefore been practically discarded. That distension of the bladder is not always without danger, is also well known; especially in persons of advanced years in whom the bladder walls are friable.

It is true that the Trendelenburg position (elevation of the pelvis), increases the dimensions of the pre-vesical space, but the median vertical incision in this position (with distension of the bladder) does not give as free access to the organ as the transverse incision. This is due to the form of the wound as produced by the median vertical incision. This wound is elliptical when pulled asunder by retractors, with the points of the ellipse at the pubes, and toward the umbilicus, so that the narrowest point of the wound is at the pubes just where the greatest amount of space is wanted for free manipulation of the deeper parts. In the transverse incision the wound is triangular or lozenge shaped, with the base or widest part right at the pubes.

TECHNIQUE.

The patient is carefully prepared; pubes shaved, bowels emptied thoroughly. He is then placed in the Trendelenburg position, the pelvis as high as necessary, so as to allow the abdominal organs to gravitate toward the diaphragm. The incision through the skin is transverse over the upper margin of the

pubes, in a slightly curved form, convexity of cut over the pubic bone; it is best to carry the convexity of the incision about one and one-half centimeters

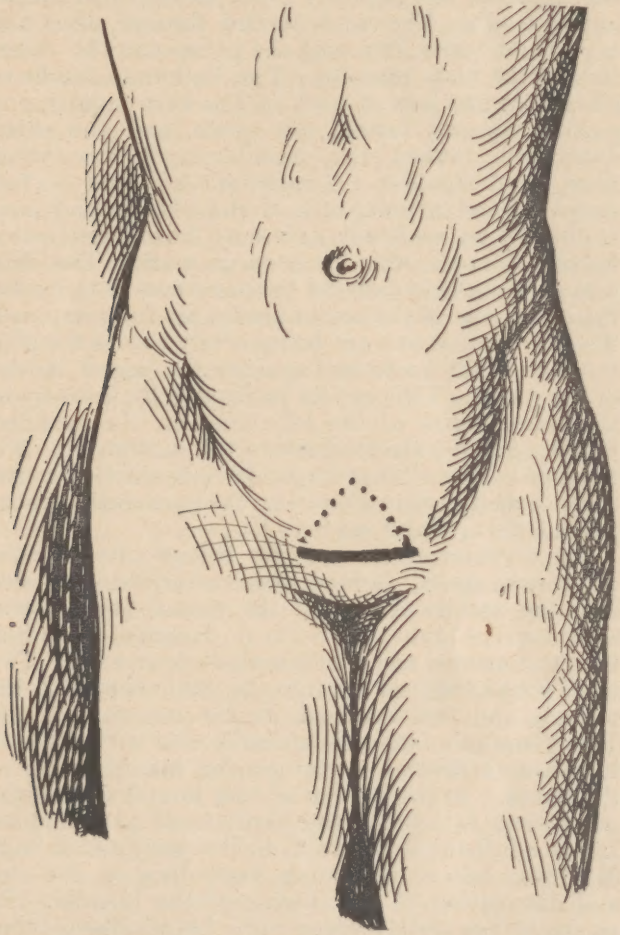

FIG 1.—The heavy line over the pubes shows the transverse incision; dotted lines the form of the wound when held apart by retractors.

onto the pubes; by doing this the insertion of the recti can be more easily severed, very close to the bone. The length of the incision extends from over the region of one inguinal canal to the other on the opposite side. The cut is carried through skin and superficial fascia, exposing the pubes and the insertion of the recti muscles. Two Volkmann hooks or retractors are now placed in the skin wound, one pulling upward toward the penis, and the other downward toward the umbilicus. A few veins may need ligation. A catheter or sound of full curve is now introduced into the bladder and controlled by an assistant, or it may have been introduced before the skin incision is made. The skin wound being held asunder by the retractors or hooks, the insertions of the recti muscles are fully exposed. Their insertions are cut transversely across, keeping the edge of the knife well against the upper border of the pubes. This can be facilitated by pressure of the index fingers of the left hand on the muscles, thereby putting the tendons on the stretch; in this manner both recti may be partially or wholly severed from their insertion as well as the pyramidalis muscles, as the operator may see fit.

The division of the muscles brings into view the pre-vesical space. A hook or retractor is now hooked into the umbilical end of the wound (the instrument must be blunt so as to run no danger of wounding the peritoneum) and traction made downward. Two more hooks are inserted into the pubic angles of the wounds and traction made to the respective sides. This gives us a large triangular wound with the base in the most favorable position for manipulation at the pubes. At the bottom of this wound we find the pre-vesical fat, veins, the peritoneum and bladder. In the adult the lower fold of the peritoneum may dip down behind the pubes, depending on the size and disposition of the fundus of the bladder. By means of rat tooth forceps or a blunt dissector or knife-handle the fat is separated; by a little care the

veins need not be injured, and no bleeding need occur by this manner of blunt dissection. The anterior wall of the bladder is exposed and is recognized by its pinkish color. The anterior wall of the bladder should be well exposed upward and downward. If the operator works skillfully, the peritoneum may not become visible during the operation. It is well at the beginning of the separation of the fat to work well down behind the pubes, for then there is no danger of encountering the peritoneum, and we can, after the bladder wall has been exposed, readily work it upward, along with the veins and pre-vesical fat. At this stage of the work the catheter comes in for its part in the technique; the assistant who has it in charge firmly depresses the ends, thus carrying the point against the anterior wall of the bladder. It can be carried higher into the fundus, or lower, as the operator may desire, and by this means he can clearly outline the extent of the bladder.

The anterior surface of the bladder having been sufficiently exposed, the catheter lifts the wall well up into the wound at any point the operator may determine. By means of a sharp hook, or better, by means of a loop of silk passed through the muscularis, the bladder is fixed; we may, if we choose, put in two loops of silk; the one near the fundus, the other lower down.

The organ is well drawn upward and the tip of the catheter is used as a guide to cut down upon; with a sharp narrow pointed knife we cut down beside the tip of the catheter into the bladder. It is well to begin the incision into the bladder near the fundus and extend the cut downward, so that one or two fingers can be introduced into the interior of the bladder. A gush of urine usually follows the opening of the organ. The interior can now be examined by the fingers, or inspected by means of an electric light introduced into the cavity. If the operation be done for calculus, it is now extracted, or any other

procedure that the particular case may require. After the operation is finished, the bladder is irrigated with a 3 per cent. boracic solution. A soft rubber T-drainage tube is now inserted into the cavity of the bladder and the other end passes out of the skin wound. Into the wound and around the tube iodoform gauze is packed. Each outer angle of the wound may be brought together by one or two sutures so as to lessen the size. A suture is passed through the skin and drainage tube, so as to retain it in its place; over this gauze and cotton.

The patient is put to bed and as soon as narcosis passes off is instructed to lie on either side, right or left, so as to admit of free drainage. The tube is left in the bladder one to two weeks. The gauze packing is removed as often as is necessary. The patient is allowed to sit in an upright position as soon as possible after three to four days.

Case.—On December 16, Mr. K. S., aged 70, residence Lebanon, Ill., was referred to me by Mr. H., a medical student of the Marion-Sims College. The patient for a year past had suffered from frequent urination. He had been treated by three or four physicians without relief. He was sent to me under the supposition that he was suffering from an enlarged prostate. Patient stated that his appetite was fairly good, he slept well, and did not have to get up very often to urinate, but during the daytime had to micturate very often, and that there was considerable pain immediately after urination. This pain he located over the pubes. Examination of the rectum revealed that the prostate was not enlarged, and could hardly be responsible for his symptoms. I introduced a sound into the bladder and it was hardly in the bladder when I came into contact with a stone located on the right side. The introduction of the sound caused him much pain, and he was attacked by a trembling spell, so that I had to desist from further investigation.

I saw him again the next day; he had a slight rise in temperature 100 degrees, and felt unwell. While holding the thermometer in his mouth he had a slight syncope. I advised an operation, and that he should go to a hospital. He agreed to operation and entered the Rebekah Hospital the following day. Urine showed slight trace of albumen.

Operation.—Wednesday morning, December 19, the opera-

tion of supra-pubic cystotomy was done. The patient had received two good doses of whisky; the one an hour before, the second a half hour before the operation. A hypodermic of 1-6 gr. of morphin was given along with the second dose of whisky. The whisky and morphin were given so as to avoid the necessity of giving much chloroform. The patient was placed in the Trendelenburg position on Edebohl's table. A silver catheter was introduced into the bladder and held by an assistant. I had taken the precaution to arrange a stop cock on my catheter, in such a manner that the nozzle of a syringe could be attached, so that I could inject the bladder should I find any difficulty in reaching the same, it not being injected. I made a transverse incision from one inguinal canal to the other; the line of incision was slightly curved, with convexity over the pubes, and carried about one and one-half centimeters onto the pubes. The cut was curved down through skin, fat and fascia onto the recti muscles. There was no bleeding. The recti and pyramidalis were now cut through, keeping the edge of the knife on the pubes. A retractor was placed in the umbilical end of the wound, drawing downward, one also into the pubic angle of the wound, drawing to the respective sides. The pre-vesical (cavum Retzii) space was now freely exposed, especially well the parts behind the pubes; with a mouse tooth forceps and a blunt dissector I cleared away the pre-vesical fat and veins over the anterior wall of the bladder.

I had my assistant press the catheter well up against the pubes as low down as possible, with the point of the catheter as a guide. I was quite safe in my manipulation, and sure that I was below the lower fold of the peritoneum. As soon as I reached the bladder, which could be easily noted by its pink color, I cleared the fat well off from the anterior wall as far as the fundus. The peritoneum did not come into sight, was covered by fat and pushed along with it out of the way. Into the anterior wall of the bladder near the fundus, I inserted a loop of silk, passing it through the muscular coats. This loop I used to fix the bladder previous to the incision. I now had my assistant crowd the point of the catheter well against the anterior wall of the bladder near the fundus. I found that it was an easy matter in this case to penetrate the bladder wall with the catheter tip. I did this, and then used the catheter as a guide, alongside of which I inserted a narrow pointed bistoury and enlarged the wound downward so that I could introduce two fingers into the bladder. The catheter was now withdrawn. I could readily feel a large, oval, flattened calculus in the right segment of the bladder. Passing a stone forceps in alongside of my fingers, I readily seized it. I found that the bladder wound was quite small for the stone to pass through;

by means of a rotary motion I pushed it out of the bladder through the wound without enlarging the same.[2]

The bladder was thoroughly washed out with a 3 per cent. boric acid solution. A soft rubber T-drainage tube was inserted in the bladder, the other end passing through the skin wound. I fastened the tube into the skin wound by a single suture through skin and tube. The depth of the wound around tube was packed with iodoform gauze, the ends left in the upper part. The outer angles were closed, each by two sutures. Into the top of the protruding drainage tube, I inserted a T-tube of tin ore, over each arm of which a rubber tube was passed. The rubber tube extended over the abdomen of the patient, well over each side. The dressings were applied so as to have the ends of these tubes protrude. The patient by this arrangement can lie on either side and the urine is carried by means of these tubes into a urinal or dressing, and thus the wound is protected, in a measure at least, from the effect of the escaping urine.

The operation occupied about half an hour. I could have done it in about twenty minutes, but a little time was lost on account of a hitch on the part of the assistants. It can easily be accomplished in a careful manner in fifteen to twenty minutes time. The patient reacted well from the operation. Not a tablespoonful of blood was lost. Twenty-four hours after the operation the temperature was 100, which, however, in the next twenty-four hours fell to normal.

On the third day the dressings were changed and the packing removed. Tube left undisturbed. Patient is doing well; rests and has no pain; urine escapes through tubes as above described.[3]

Remarks.—The experience gained by an operation by a new method in a single case can not usually be taken as a criterion of the value of a method, unless its merit has been established by other operators. Its decided advantage over the median vertical incision was, however, clearly demonstrated and especially the ease with which the pre-vesical space is laid open, and the lessened danger of wounding the peritoneum. This is easily understood when we bear

[2] Mulberry calculus, 1¾ inches long, 1½ inches wide; weight 1 oz., 2 drachms.

[3] February 20. Wound closed. Urine passing per viam naturalam.

in mind that in the transverse incision, we cut parallel with the lowest fold of the peritoneum, as it is reflected over the fundus of the bladder and in a direction that is oblique to it, or in other words away from it.

In the median vertical incision the opposite obtains, as here we cut directly at right angles to the peritoneum, and directly over it in the umbilical end of the wound.

Based on the experience of others, and my own in the case reported, I would offer the following conclusions:

1. That the transverse incision is more easily executed from a technical standpoint.

2. That it affords more space in which to work in the depths of the wound than the median incision, and hence superior for any exploration of the bladder, for whatever condition.

3. That there is less liability to injury of the peritoneum, because the knife is used parallel with and on a level below its lowest fold.

4. That it is unnecessary to inflate the rectum.

5. That it is unnecessary to inject the bladder, and consequently, the risk of injury to the organ is avoided, which in the aged is an element that should always be considered.

6. That the catheter in the bladder is a safe guide to the location of the fundus and anterior wall.

7. That with the catheter as a guide, the bladder can be incised with ease and facility.